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THE SILVERFISH;¹ AN INJURIOUS HOUSEHOLD INSECT.

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INTRODUCTION.

The silverfish (fig. 1) is often one of the most troublesome enemies of books, papers, card labels in museums, and starched clothing, and occasionally of stored food substances. Its peculiar fishlike form and scaly, glistening body, together with its very rapid movements and active efforts at concealment whenever it is uncovered, have attached considerable popular interest to it and have resulted in its receiving a number of more or less descriptive popular names, such as silverfish, silver louse, silver witch, sugarfish, etc. The species named above is the common one in England, but it also occurs in this country, and, like most other domestic insects, it is now practically cosmopolitan. It has a number of near allies, which closely resemble it, both in appearance and habits. One of these, (*Lepisma*) *Thermobia domestica* Pack., has certain peculiarities of habit which will be referred to later. The unusual appearance of the common silverfish early drew attention to it, and a fairly accurate description of it, given in a little work published in London in 1665 by the Royal Society, is interesting enough to reproduce:

It is a very small, silvery, shining worm or moth which I found much conversant among books and papers, and is supposed to be that which corrodes and eats holes

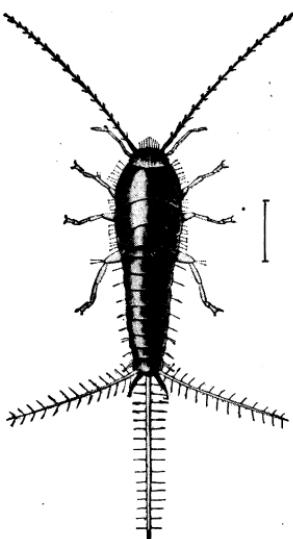


FIG. 1.—The silverfish (*Lepisma saccharina*): Adult. Enlarged. (Original.)

¹ *Lepisma saccharina* L. Thysanura, family Lepismatidæ.

NOTE.—This bulletin is of special interest to housekeepers throughout the United States. It is a revision of Circular No. 49 of the Bureau of Entomology, U. S. Department of Agriculture.

through the leaves and covers. It appears to the naked eye a small, glittering, pearl-colored moth, which upon the removing of books and papers in the summer, is often observed very nimbly to scud and pack away to some lurking cranny where it may better protect itself from any appearing dangers. Its head appears big and blunt, and its body tapers from it toward the tail, smaller and smaller, being shaped almost like a carrot.¹

HABITS AND INJURY.

On account of its always shunning the light and its ability to run very rapidly to places of concealment, it is not often seen and is most difficult to capture, and being clothed with smooth, glistening scales, it will slip from between the fingers and is almost impossible to secure without crushing or damaging. It is one of the most serious pests in libraries, particularly to the binding of books, and will frequently eat off the gold lettering to get at the paste beneath, or, as reported by the late P. R. Uhler, of Baltimore, often gnaws off white slips glued on the backs of books. Heavily glazed paper seems very attractive to this insect, and it has frequently happened that the labels in museum collections have been disfigured or destroyed by it, the glazed surface having been entirely eaten off. In some cases books printed on heavily sized paper will have the surface of the leaves a good deal scraped, leaving only the portions covered by the ink. It will also eat any starched clothing, linen, or curtains, and has been known to do very serious damage to silks which had probably been stiffened with sizing. Its damage in houses, in addition to its injury to books, consists in causing the wall paper to scale off by its feeding on the starch paste. It occasionally gets into vegetable drugs or similar material left undisturbed for long periods. It is reported also to eat occasionally into carpets and plush-covered furniture, but this is open to question.

STRUCTURE AND RELATIONSHIPS.

The silverfish belongs to the lowest order of insects—the Thysanura—is wingless, and of very simple structure. It is a wormlike insect about one-third of an inch in length, tapering from near the head to the extremity of the body. The head carries two prominent antennæ, and at the tip of the body are three long, bristle-shaped appendages, one pointing directly backward and the other two extending out at a considerable angle. The entire surface of the body is covered with very minute scales like those of a moth. Six legs spring from the thorax, and, while not very long, they are powerful and enable the insect to run with great rapidity.

In certain peculiarities of structure, and also in their habits, these anomalous insects much remind one of roaches, and their quick, gliding movements and flattened bodies greatly heighten this resemblance. More striking than all, however, is the remarkable development of the coxæ or basal joints of the legs in the silverfish, which

¹ Hooke, R., *Micrographia*, p. 208-210. London, 1665.

finds its counterpart in roaches, and, taken in connection with the other features of resemblance, seems to point to a very close alliance between the two groups, if, indeed, the silverfish are not merely structurally degraded forms of roaches and to be properly classed with the Blattidæ.

ANOTHER COMMON SPECIES.

Another common silverfish of this country, referred to in the opening paragraph, has developed a novel habit of frequenting ovens and fireplaces, and seemingly revels in an amount of heat which would be fatal to most other insects. It disports itself in numbers about the openings of ranges and over the hot bricks and metal, manifesting a most surprising immunity from the effects of high temperature. This heat-loving or bakehouse species (fig. 2) was described in 1873 as *Lepisma domestica* by Packard, who reported it to be common about fireplaces at Salem, Mass. This species is also very abundant in Washington. What is evidently this same insect began to be noted commonly about 1895 in England and on the Continent, where it manifests the same liking for hot places exhibited by it in this country. The habit of this species of congregating in bakehouses and dwellings, about fireplaces and ovens, has given rise to the common appellation in England of "fire-brat." Similar descriptive names are applied to it also on the Continent. This species closely resembles the common silverfish in size and general appearance, but may be readily distinguished from it by the presence on the upper surface of dusky markings. It also possesses well-

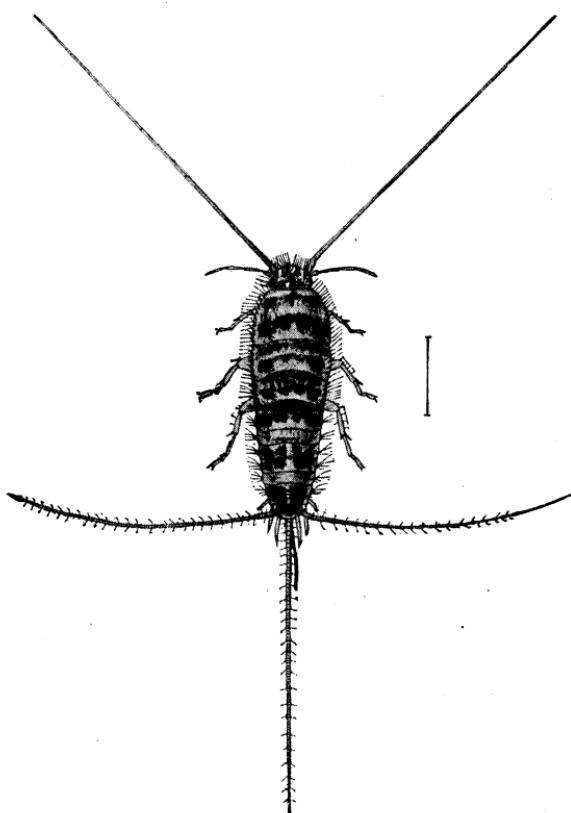


FIG. 2.—The "fire-brat" (*Thermobia domestica*): Adult female. Enlarged. (Original.)

marked structural differences, which have led to its late reference to a distinct genus—*Thermobia*. An Italian entomologist, Rovelli, has described this insect under the descriptive name *furnorum*, from its inhabiting ovens, and the name of the genus to which it is now assigned by English entomologists is also descriptive of its heat-loving character. A Dutch entomologist, Oudemans, reports that he has found it in abundance in all bakehouses that he has examined in Amsterdam, where it is well known to bakers and has received a number of familiar names.

REMEDIES.

Advantage may be taken of the liking of these insects for fabrics and other articles containing starch to poison them by slipping into all the crevices where they occur—in bookshelves and backs of mantels, under washboards, and in the bottoms of drawers—bits of cardboard on which a thin boiled starch paste poisoned with from 3 to 5 per cent powdered white arsenic has been spread and dried. The arsenic should be added to the flour and sufficient water used to make a thin paste by boiling. One of our correspondents reports complete relief by this measure.

The silverfish readily succumbs to pyrethrum, and wherever this can be applied, as on bookshelves, it furnishes one of the best means of control.

Sodium fluorid,¹ now recognized as one of the most efficient roach powders, will doubtless also be equally effective against silverfish. Where such course is possible it may be dusted by hand or with a powder blower in the situations where silverfish occur.

For starched clothing and similar objects liable to injury by it, frequent handling and airing and the destruction by hand of all specimens discovered is to be recommended, in addition to the remedies noted above. Little damage is likely to occur in houses except in comparatively moist situations or where stored objects remain undisturbed for a year or more.

¹ Marlatt, C. L. Cockroaches. U. S. Dept. Agr., Farmers' Bulletin 658, 15 p., 5 fig., 1915. Reference to sodium fluorid against roaches, p. 12.